SECTION 07321

COMPOSITE ROOF TILE SYSTEMS

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\*\* NOTE TO SPECIFIER \*\* EcoStar LLC; composite roof tile systems and accessories.  
This section is based on the products of EcoStar LLC, which is located at:  
42 Edgewood Dr.  
Holland, NY 14080  
Toll Free Tel: 800-211-7170  
Tel: 716-537-3153  
Fax: 888-780-9870  
Email: [request info (info@ecostarllc.com)](https://admin.arcat.com/users.pl?action=UserEmail&company=EcoStar+LLC&coid=41887&rep=&fax=888-780-9870&message=RE:%20Spec%20Question%20(07321eco):%20%20&mf=)  
Web: <http://ecostarllc.com>   
  
 [ [Click Here](https://www.arcat.com/arcatcos/cos41/arc41887.html) ] for additional information.  
  
EcoStar's goal is to provide high-quality, competitively-priced premium steep-slope roofing products using rubber and plastics technology. With premium products and superior service, EcoStar has an ideal solution for virtually every steep-slope roofing application.   
With an extensive line of top-quality products, EcoStar provides an efficient, environmentally-friendly, durable and aesthetically pleasing solution for virtually any steep-slope roofing application. With a constant pursuit of both innovation and excellence, EcoStar is able to provide the most advanced technology and the highest level of service in the industry.  
All EcoStar products provide supreme protection against fire, hail, wind and rain, offering enhanced durability and long-term performance. EcoStar products are available with extended warranty protection, including a 110 mph wind warranty and a 50-year transferable Gold Star material and labor warranty. EcoStar backs up its extensive product line with excellent technical and marketing services and customer service representatives at our Holland, NY office.  
EcoStar LLC has strong sales and marketing leadership who have been with the brand since 1998. EcoStar LLC continues to lead the market with their polymer-based slate and shake roofing tiles. Its well known base of manufacturer's representatives and distributors has been instrumental in the success of the product since its inception.

1. GENERAL
   1. SECTION INCLUDES

\*\* NOTE TO SPECIFIER \*\* Delete items below not required for project.

* + 1. Polymeric slate roof tile system and accessories.
    2. Polymeric shake roof tile system and accessories.
  1. RELATED SECTIONS

\*\* NOTE TO SPECIFIER \*\* Delete sections below not relevant to this project; add others as required.

* + 1. Section 06100 - Rough Carpentry.
    2. Section 07600 - Flashing and Sheet Metal.
    3. Section 07700 - Roof Specialties and Accessories.
  1. REFERENCES

\*\* NOTE TO SPECIFIER \*\* Delete references from list below not required by text of edited section.

* + 1. ASTM International (ASTM):
       1. ASTM D 31 - Methods of Testing Woven Textiles Fabrics.
       2. ASTM D 412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers - Tension.
       3. ASTM D 570 - Standard Test Method for Water Absorption of Plastics.
       4. ASTM D 638 - Standard Test Method for Tensile Properties of Plastics.
       5. ASTM D 790 - Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
       6. ASTM D 2626 - Standard Specification for Asphalt-Saturated and Coated Organic Felt Base Sheet Used in Roofing.
       7. ASTM G 155 - Standard Practice for Operating Xenon Arc Light Apparatus for Exposure of Non-Metallic Materials.
    2. Underwriters Laboratories, Inc. (UL):
       1. UL 790 - Standard Test Methods for Fire Tests of Roof Coverings.
       2. UL 580 - Tests for Uplift Resistance of Roof Assemblies.
       3. UL 2218 - Impact Resistance of Prepared Roof Covering Materials.
       4. UL ER 18920-01.
    3. Dade County Building Code:
       1. PA100 - Test Procedure for Wind and Wind Driven Rain Resistance of Discontinuous Roofing System.
       2. Notice of Acceptance for Empire product lines.
       3. Notice of Acceptance for Glacier Guard 100.
  1. SUBMITTALS
     1. Submit under provisions of Section 01300.
     2. Product Data: Manufacturer's data sheets on each product to be used, including:
        1. Shingles, underlayment, flashings, fasteners, and accessories indicating composition, properties, and dimensions. Provide data showing compliance with specified requirements.
        2. Preparation instructions and recommendations.
        3. Storage and handling requirements and recommendations.
        4. Installation methods.
     3. Shop Drawings: Provide shop drawings indicating details of construction and installation including but not limited to dimensions, penetrations and roof slope.

\*\* NOTE TO SPECIFIER \*\* When an EcoStar Gold Star warranty is desired, EcoStar must be contacted prior to project award and installation. Additional information will be required for wind speeds greater than 90 MPH and deviation from standard slope requirements. Delete if not required.

* + 1. Warranty: Submit manufacturer's project number indicating EcoStar Gold Star warranty is available for this project prior to ordering materials and beginning installation.

\*\* NOTE TO SPECIFIER \*\* Delete selection samples if selections have already been made.

* + 1. Selection Samples: Submit two sets of samples showing full range of available colors, patterns, textures, and finishes.
    2. Verification Samples: For each product specified; two samples, representing colors, patterns, textures, and finishes to be installed.
  1. QUALITY ASSURANCE

\*\* NOTE TO SPECIFIER \*\* To qualify for an EcoStar Gold Star warranty, an authorized EcoStar Gold Star applicator must install system. Delete if not required.

* + 1. Installer Qualifications: Authorized EcoStar Gold Star applicator.

\*\* NOTE TO SPECIFIER \*\* For an EcoStar Gold Star warranty, upon completion of the installation, an inspection must be conducted by a Field Service Representative of EcoStar. This is not intended to be a final inspection for the benefit of the Owner, but for the benefit of EcoStar to determine whether a warranty shall be issued. Delete if not required.

* + 1. Inspection: Upon completion of the installation, an inspection shall be conducted by manufacturer's Field Service Representative to ascertain that the roofing system has been installed according to manufacturer's published specifications and details at time of bid. This is not intended to be a final inspection for the benefit of the Owner, but for the manufacturer to determine whether a warranty shall be issued.
    2. Testing Requirements: Comply with the following requirements.
       1. Impact Resistance: UL 2218 Test Standard; Class 4.
       2. Wind Driven Rain: PA100 Test Standard.
       3. Wind Uplift: UL 580 Test Standard.

\*\* NOTE TO SPECIFIER \*\* Include a mock-up if the project size and/or quality warrant taking such a precaution. The following is one example of how a mock-up on a large project might be specified. When deciding on the extent of the mock-up, consider all the major different types of work on the project.

* + 1. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
       1. Finish areas designated by Architect.
       2. Do not proceed with remaining work until workmanship and color are approved by Architect.
       3. Modify mock-up area as required to produce acceptable work.
  1. DELIVERY, STORAGE AND HANDLING
     1. Deliver, store and handle materials and products in strict compliance with manufacturer's instructions and recommendations and industry standards. Store materials within absolute limits for temperature and humidity recommended by the manufacturer. Protect from damage.
        1. Store tile materials above 45 degrees F (7.2 degrees C). If exposed to lower temperatures, restore product temperature to 45 degrees F (7.2 degrees C) minimum before using.
        2. Store materials in a dry protected area. Damaged materials shall not be used as part of finished installation.

\*\* NOTE TO SPECIFIER \*\* The following paragraph applies only to projects using a Gold Star Authorized Applicator. Delete if not required.

* + - 1. Installed materials found to be damaged shall be replaced at Gold Star Authorized Applicator's expense.
    1. Deliver materials in original unopened packages. Store products in manufacturer's labeled packaging until ready for installation. Packages shall be labeled with manufacturer's name, brand name and identification of various items.
  1. PROJECT CONDITIONS
     1. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.
  2. SEQUENCING AND SCHEDULING
     1. Conference: Convene a pre-installation conference to establish procedures to maintain optimum working conditions and to coordinate this work with related and adjacent work.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* 1. WARRANTY

\*\* NOTE TO SPECIFIER \*\* EcoStar does not warrant metal flashing. Only when an EcoStar Field Service Representative has inspected and approved the completed installation will an EcoStar Gold Star warranty be issued. EcoStar will provide the Gold Star warranty for those materials supplied by EcoStar when an authorized EcoStar Gold Star applicator completes the project and all required materials have been utilized within the roof system. The warranty is available for most types of buildings and structures. Information will be required for wind speeds greater than 90 MPH and deviation from standard slope requirements. The warranty does not cover the aesthetic appearance of the roof installation. EcoStar roofing nails when used in the roof system are included in the EcoStar Warranty. Copper metal work may stain EcoStar Tiles if runoff from the metal work comes into contact with the roof tiles; including but not limited to ridges and cupolas.

* + 1. Warranty: Provide manufacturer's 50-year EcoStar Gold Star warranty.

1. PRODUCTS
   1. MANUFACTURERS
      1. Acceptable Supplier: EcoStar LLC, which is located at: 42 Edgewood Dr.; Holland, NY 14080; Toll Free Tel: 800-211-7170; Tel: 716-537-3153; Fax: 888-780-9870; Email: [request info (info@ecostarllc.com)](https://admin.arcat.com/users.pl?action=UserEmail&company=EcoStar+LLC&coid=41887&rep=&fax=888-780-9870&message=RE:%20Spec%20Question%20(07321eco):%20%20&mf=); Web: <http://ecostarllc.com>

\*\* NOTE TO SPECIFIER \*\* Delete one of the following two paragraphs; coordinate with requirements of Division 1 section on product options and substitutions.

* + 1. Substitutions: Not permitted.
    2. Requests for substitutions will be considered in accordance with provisions of Section 01600.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* 1. POLYMERIC SLATE ROOF TILE SYSTEMS (MAJESTIC SLATE)
     1. Roof Tiles: Majestic Slate tiles as manufactured by EcoStar LLC.
        1. Material: Starloy, 80 percent recycled rubber and plastic compound with colorants and UV stabilizers.
        2. Compliance:
           1. Fire Rating: UL 790, Class C fire resistance.
           2. Impact Resistance: UL 2218, Class 4.
           3. UV Exposure: Tested in accordance with ASTM G 155, prolonged exposure.
           4. Water Absorption: ASTM D 570, 0 percent by weight.
        3. Tapered Thickness: Nominal 1/4 inch (6 mm).
        4. Tile Length: 18 inches (457 mm).

\*\* NOTE TO SPECIFIER \*\* Delete product and associated text not required.

* + - 1. Product: Majestic Slate Traditional Design.

\*\* NOTE TO SPECIFIER \*\* Tile width not required.

* + - * 1. Tile Width: 10 inches (254 mm).
        2. Tile Width: 12 inches (305 mm).

\*\* NOTE TO SPECIFIER \*\* Delete options for exposure and associated text not required.

* + - * 1. Exposure: 7 inches (178 mm).
        2. Exposure: 6-1/2 inches (165 mm).
        3. Exposure: 6 inches (152 mm).
        4. Exposure: As indicated on Drawings.

\*\* NOTE TO SPECIFIER \*\* Delete product and associated text not required.

* + - 1. Product: Majestic Slate Designer Series.

\*\* NOTE TO SPECIFIER \*\* Delete design not required.

* + - * 1. Design: Chisel Point.
        2. Design: Beveled Edge.
        3. Design: Beaver Tail.
        4. Design: As indicated on Drawings.
        5. Tile Width: 12 inches (305 mm).

\*\* NOTE TO SPECIFIER \*\* 6 inches is the only approved exposure for Chisel Point tiles.

* + - * 1. Exposure: 7 inches (178 mm).
        2. Exposure: 6-1/2 inches (165 mm).
        3. Exposure: 6 inches (152 mm).
        4. Exposure: As indicated on Drawings.

\*\* NOTE TO SPECIFIER \*\* Delete product and associated text not required.

* + - 1. Product: Majestic Niagara Series.
         1. Composition: 80% post-industrial recycled materials.
         2. Design: As indicated on Drawings.
         3. Thickness: 5/8 inch (15.8 mm).
         4. Tile Width: 12 inches (305 mm).
         5. Tile Width: 14 inches (355 mm).
         6. Exposure: 9 inches (228 mm).
         7. Exposure: 10 inches (254 mm).
         8. Exposure: As indicated on Drawings.

\*\* NOTE TO SPECIFIER \*\* Majestic Slate Hip and Ridge Tiles are installed at a 6" exposure only. Majestic Niagara Slate Hip and Ridge Tiles can be installed at a 7", 8" or 9" exposure.

* + - 1. Majestic Slate Hip and Ridge:
         1. Description: Tile-over ridge provides protection against rain, snow and ice.
         2. Water Absorption: ASTM D 570, 0 percent by weight.
         3. Majestic Slate Length: 18 inches (457 mm).
         4. Majestic Slate Width: 12 inches (305 mm).
         5. Majestic Niagara Slate Length: 22" (559 mm).
         6. Majestic Niagara Slate Width: 14" (356 mm).
         7. Thickness: Nominal 1/4 inch (6 mm).

\*\* NOTE TO SPECIFIER \*\* Additional colors are available. Delete color not required.

* + - 1. Color:
         1. Color: Black.
         2. Color: Midnight Gray.
         3. Color: Federal Gray.
         4. Color: Smoke Gray.
         5. Color: Earth Green.
         6. Color: Stone Red.
         7. Color: Mountain Plum.
         8. Color: Cedar Brown.
         9. Color: Chestnut Brown.
         10. Color: Sage Green.
         11. Color: Driftwood.
         12. Color: As indicated on Drawings.
  1. POLYMERIC SHAKE ROOF TILE SYSTEMS (SENECA)
     1. Roof Tiles: Seneca Tiles as manufactured by EcoStar LLC.
        1. Material: Starloy, 80 percent recycled rubber and plastic compound with appropriate colorants and UV stabilizers.
        2. Compliance:
           1. Fire Rating: UL 790, Class C fire resistance.
           2. Impact Resistance: UL 2218, Class 4.
           3. UV Exposure: Tested in accordance with ASTM G 155, prolonged exposure.
           4. Water Absorption: ASTM D 570, 0 percent by weight.
        3. Widths: Packaged in a blend of 6 inches (154 mm), 9 inches (229 mm) and 12 inches (305 mm).
        4. Length: 19 inches (483 mm).

\*\* NOTE TO SPECIFIER \*\* Delete product not required.

* + - 1. Product: Seneca Shake Tiles.
         1. Tapered Thickness: Nominal 3/8 inch (9.5 mm).

\*\* NOTE TO SPECIFIER \*\* Delete exposure not required.

* + - * 1. Exposure: 8 inches (203 mm).
        2. Exposure: 7-1/2 inches (191 mm).
        3. Exposure: 7 inches (178 mm).
        4. Exposure: As indicated on Drawings.
      1. Product: Seneca Plus Shake Tiles.
         1. Tapered Thickness: Nominal 3/4 inch (19 mm).
      2. Product: Seneca Shake Hip and Ridge:
         1. Description: Tile-over ridge provides protection against rain, snow and ice.

\*\* NOTE TO SPECIFIER \*\* Seneca Shake Hip and Ridge Tiles are installed at a 6" exposure only

* + - * 1. Tensile Strength: ASTM D 412, 500 psi.
        2. Water Absorption: ASTM D 570, 0 percent by weight.
        3. Length: 19 inches (483 mm).
        4. Width: 12 inches (305 mm).
        5. Thickness: Nominal 3/8 inch (9.5 mm).

\*\* NOTE TO SPECIFIER \*\* Delete colors not required.

* + - 1. Color:
         1. Color: Black.
         2. Color: Midnight Gray.
         3. Color: Federal Gray.
         4. Color: Smoke Gray.
         5. Color: Earth Green.
         6. Color: Stone Red.
         7. Color: Mountain Plum.
         8. Color: Cedar Brown.
         9. Color: Chestnut Brown.
         10. Color: Sage Green.
         11. Color: Driftwood.
         12. Color: As indicated on Drawings.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* 1. POLYMERIC SLATE ROOF TILE SYSTEMS (EMPIRE SLATE)
     1. Roof Tiles: Empire Slate tiles as manufactured by EcoStar LLC.
        1. Material: Thermoplastic polyolefin compound with colorants and UV stabilizers.
        2. Compliance:

\*\* NOTE TO SPECIFIER \*\* Delete fire rating not required.

* + - * 1. Fire Rating: UL 790, Class A fire resistance.
        2. Fire Rating: UL 790, Class C fire resistance.
        3. Impact Resistance: UL 2218, Class 4.
        4. UV Exposures Tested in accordance with ASTM G 155 prolonged exposure.
        5. Miami Dade listed.
      1. Tapered Thickness: Nominal 1/4 inch (6 mm).
      2. Tile Length: 18 inches (457 mm).

\*\* NOTE TO SPECIFIER \*\* Delete product and associated text not required.

* + - 1. Product: Empire Slate Design - Traditional.

\*\* NOTE TO SPECIFIER \*\* Delete tile width not required.

* + - * 1. Tile Width: 10 inches (254 mm).
        2. Tile Width: 12 inches (305 mm).

\*\* NOTE TO SPECIFIER \*\* Delete exposure and associated weight by width not required.

* + - * 1. Exposure: 8 inches (203 mm).
        2. Exposure: 7-1/2 inches (191 mm).
        3. Exposure: 7 inches (178 mm).
        4. Exposure: 6-1/2 inches (165 mm).
        5. Exposure: 6 inches (152 mm).
        6. Exposure: As indicated on Drawings.

\*\* NOTE TO SPECIFIER \*\* Delete product and associated text not required.

* + - 1. Product: Empire Slate Designer Series.

\*\* NOTE TO SPECIFIER \*\* Delete options for design not required.

* + - * 1. Design: Chisel Point.
        2. Design: Beveled Edge.
        3. Design: Beaver Tail.
        4. Tile Width: 12 inches (305 mm).

\*\* NOTE TO SPECIFIER\*\* 6 inches is the only approved exposure for Chisel Point tiles. Delete exposure not required.

* + - * 1. Exposure: 7 inches (178 mm).
        2. Exposure: 6-1/2 inches (165 mm).
        3. Exposure: 6 inches (152 mm).

\*\* NOTE TO SPECIFIER \*\* Delete product and associated text not required.

* + - 1. Product: Empire Niagara Series.
         1. Composition: 25% post-industrial recycled materials.
         2. Design: As indicated on Drawings.
         3. Thickness: 5/8 inch (15.8 mm).
         4. Tile Width: 12 inches (305 mm).
         5. Tile Width: 14 inches (355 mm).
         6. Exposure: 9 inches (228 mm).
         7. Exposure: 10 inches (254 mm).
         8. Exposure: As indicated on Drawings.

\*\* NOTE TO SPECIFIER \*\* Empire Slate Hip and Ridge Tiles are installed at a 6" exposure only. Empire Niagara Hip and Ridge Tiles can be installed at a 7", 8" or 9" exposure.

* + - 1. Empire Slate Hip and Ridge:
         1. Description: Tile-over ridge provides protection against rain, snow and ice.
         2. Tensile Strength: ASTM D 412, 500 psi.
         3. Water Absorption: ASTM D 570, 0 percent by weight.
         4. Empire Slate Length: 18 inches (457 mm).
         5. Empire Slate Width: 12 inches (305 mm).
         6. Empire Niagara Slate Length: 22 inches (559 mm).
         7. Empire Niagara Slate Width: 14 inches (356 mm).
         8. Thickness: Nominal 1/4 inch (6 mm) for Empire Slate, nominal 5/8 inch (16 mm) for Empire Niagara Slate.

\*\* NOTE TO SPECIFIER \*\* Custom colors available. Delete colors not required.

* + - 1. Color:
         1. Color: Bedford Black.
         2. Color: Manhattan Midnight.
         3. Color: Freeport Federal.
         4. Color: Saranac Smoke.
         5. Color: Geneva Grove.
         6. Color: Fairport Fern.
         7. Color: Hampton Harbour.
         8. Color: Auburn Acorn.
         9. Color: Monticello Merlot.
         10. Color: Plymouth Patina
         11. Color: Tioga Terra Cotta
         12. Color: Cool Sea Salt.
         13. Color: Cool Drifting Dunes.
         14. Color: Cool Saratoga Sunset.
         15. Color: As indicated on Drawings.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* 1. POLYMERIC SHAKE ROOF TILE SYSTEMS (EMPIRE SHAKE)
     1. Roof Tiles: Empire Tiles as manufactured by EcoStar LLC.
        1. Material: Thermoplastic polyolefin compound with colorants and UV stabilizers.
        2. Compliance:

\*\* NOTE TO SPECIFIER \*\* Delete fire rating not required.

* + - * 1. Fire Rating: UL 790, Class A fire resistance.
        2. Fire Rating: UL 790, Class C fire resistance.
        3. Impact Resistance: UL 2218, Class 4.
        4. Miami Dade listed.
      1. Widths: Packaged in a blend of 6 inches (154 mm), 9 inches (229 mm) and 12 inches (305 mm) widths.
      2. Length: 20 inches (508 mm).

\*\* NOTE TO SPECIFIER \*\* Delete exposures not required.

* + - 1. Product: Empire Shake Tiles.
         1. Tapered Thickness: Nominal 3/8 inch (9.5 mm).
         2. Exposure: 9 inches (229 mm).
         3. Exposure: 8-1/2 inches (216 mm).
         4. Exposure: 8 inches (203 mm).
         5. Exposure: 7-1/2 inches (191 mm).
         6. Exposure: 7 inches (178 mm).
         7. Exposure: As indicated on Drawings
      2. Product: Empire Shake Plus Tiles.
         1. Tapered Thickness: Nominal 3/4 inch (19 mm).
         2. Exposure: 9 inches (229 mm).
         3. Exposure: 8-1/2 inches (216 mm).
         4. Exposure: 8 inches (203 mm).
         5. Exposure: 7-1/2 inches (191 mm).
         6. Exposure: 7 inches (178 mm).
         7. Exposure: As indicated on Drawings.
      3. Empire Shake Hip and Ridge: Empire Shake Hip and Ridge Tiles are installed at a 6" exposure.
         1. Description: Tile-over ridge provides protection against rain, snow and ice.
         2. Tensile Strength: ASTM D 412, 500 psi.
         3. Water Absorption: ASTM D 570, 0 percent by weight.
         4. Length: 19 inches (483 mm).
         5. Width: 12 inches (305 mm).
         6. Thickness: Nominal 3/8 inch (9.5 mm).

\*\* NOTE TO SPECIFIER \*\* Delete colors not required.

* + - 1. Color:
         1. Color: Bedford Black.
         2. Color: Manhattan Midnight.
         3. Color: Freeport Federal.
         4. Color: Saranac Smoke.
         5. Color: Geneva Grove.
         6. Color: Fairport Fern.
         7. Color: Hampton Harbour.
         8. Color: Auburn Acorn.
         9. Color: Monticello Merlot.
         10. Color: Plymouth Patina
         11. Color: Tioga Terra Cotta
         12. Color: Cool Sea Salt.
         13. Color: Cool Drifting Dunes.
         14. Color: Cool Saratoga Sunset.
         15. Color: As indicated on Drawings.
  1. ACCESSORlES

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + 1. Underlayment:

\*\* NOTE TO SPECIFIER \*\* Aqua Guard Roofing Underlayment provides superior protection for building interiors while offering a stronger and lighter alternative to traditional felt underlayment. Manufactured with a combination of polyethylene and polypropylene, Aqua Guard is a cost-effective material that provides superior protection against tearing and exposure to the elements, and will not crack or dry in extreme temperatures. Offering easy installation and a skid-resistant surface, Aqua Guard meets national building codes, and is ideal for both residential and commercial applications. Delete products not required.

* + - 1. Product: Aqua Guard Underlayment as supplied by EcoStar LLC.

\*\* NOTE TO SPECIFIER \*\* Aqua Guard roofing underlayment is recognized as an alternative to Type 30 roofing underlayment.

* + - * 1. Description: Spun bonded polyolefin coated with a layer of UV stabilized polyolefin on both sides, meeting requirements of ASTM D 2626; without perforations.

\*\* NOTE TO SPECIFIER \*\* Glacier Guard is a self-adhering sheet membrane designed to provide superior protection for roofing substrates. Glacier Guard offers enhanced protection against moisture penetration from wind-driven rain and water backup caused by ice dams.

* + - 1. Product: Glacier Guard - Granular Surface 100 (55-mil) as supplied by EcoStar LLC.
         1. Description: Specialty underlayment; composite membrane consisting of fiberglass reinforced rubberized asphalt coated with a granular surface providing maximum skid resistance.
      2. Product: Glacier Guard - Smooth Surface High Temperature 300 (40-mil) as supplied by EcoStar LLC.
         1. Description: Specialty underlayment; composite membrane consisting of fiberglass reinforced rubberized asphalt laminated to an impermeable polyethylene film layer.

\*\* NOTE TO SPECIFIER \*\* VersaShield provides an extra layer of moisture protection between the roofing material and the roof deck. It offers the best protection against fire penetration. It helps provide temporary moisture resistance and can be left exposed for up to 60 days if necessary.

* + - 1. Product: GAF VersaShield as supplied by EcoStar LLC.
         1. Description: Used in conjunction with UL Class A roof tiles for those roof applications requiring UL Class A fire rating.
    1. Fasteners:

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + - 1. Underlayment Fasteners: Provided by installer.
         1. Fasteners shall be corrosive-resistant, plastic-capped roofing nails with a minimum plastic cap diameter of 1 inch. Fasteners shall be 90 degrees to the roof deck and shall not be under or over driven.

\*\* NOTE TO SPECIFIER \*\* Composed of stainless steel, EcoStar Fasteners provide superior strength and resistance to corrosion, staining and leaking. EcoStar Fasteners offer a tensile strength between 125,000 and 145,000 pounds per square inch, with an ultimate lateral load that is nearly 20 percent higher than that of traditional steel fasteners. While their standard lengths are 1-1/2 inches (38 mm) and 1-3/4 inches (44 mm), EcoStar Fasteners are available in various lengths upon request.

* + - 1. Tile Fasteners: Stainless steel, EcoStar ring shank roofing nail as supplied by EcoStar LLC.
         1. Head: 3/8 inch (9.5 mm) diameter head.

\*\* NOTE TO SPECIFIER \*\* Delete options for nails not required.

* + - * 1. Nails: In coils, ring shank, for use in pneumatic tools - available in 1-1/2 inch (38 mm) and 1-3/4 inch (44 mm).
        2. Nails: Hand-drive ring shank style - available in 1-1/2 inch (38 mm), 1-3/4 inch (44 mm), 2 inch (51 mm) and 2-1/2 inch (64 mm).

\*\* NOTE TO SPECIFIER \*\* EcoStar EcoVent ridge ventilation product must be used on those projects that will be using a ridge ventilation system. If a ridge ventilation system is not to be used on the project, another form of ventilation may be used, but will not be covered by any EcoStar warranties. EcoStar advises that a ridge style venting system be utilized to insure the best possible air movement and to provide the best aesthetic appearance to the roofing system. Delete if not required.

* + 1. Ridge Vent:
       1. EcoVent as supplied by EcoStar. Manufactured in 20-foot (6096 mm) long by 10.5 inches (267 mm) wide rolls. Manufactured with a low-profile design that allows it to sit under hip and ridge tiles.

\*\* NOTE TO SPECIFIER \*\* EcoStar roofing nails when used in the Majestic Slate roof system are included in the EcoStar Warranty.

* + 1. Metalwork and Flashing:

\*\* NOTE TO SPECIFIER \*\* Delete options for material not required.

* + - 1. Material: Stainless Steel.
      2. Material: Copper.
      3. Material: As indicated on Drawings.

\*\* NOTE TO SPECIFIER \*\* Featuring an open octagon grid design, NOVA Walkway Pads eliminate ponding liquid, allowing the free flow of liquids below the pads. With a unique interlocking design, the pads are easy to install and provide increased resistance to water, oils and chemicals, offering maximum product life and traction durability. Delete if not required.

* + 1. Walkway Pads:
       1. Product: Nova Walkway Pads as manufactured by EcoStar LLC.
       2. Description: Interlocking pads to form a high-performance roofing walkway system; non-absorbent, skid-resistant surface.
       3. Material: Proprietary polymer composed of 100 percent recycled, post-industrial rubber and plastic.

1. EXECUTION
   1. PREPARATION
      1. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
         1. Contact the manufacturer's Technical Department for procedures when installing tile roof system during temperatures lower than 45 degrees F (7.2 degrees C).
         2. Existing roof material must be removed and a clean substrate, free of foreign material, must be provided prior to the installation of the tile roof system.
         3. Roofing surface must be free of ice, water, or snow, prior to and during the roofing project. The building owner or owner's representative is responsible for ensuring that wet or damaged substrate has been removed in a re-roofing application.
         4. Decking materials must be dimensionally stable prior to installing the tiles. If the materials are not dry, manufacturer recommends installing the underlayment and allowing the roof to dry out before installing tiles.
      2. If preparation is the responsibility of another installer, notify Architect in writing of deviations from manufacturer's recommended installation tolerances and conditions.
      3. Do not proceed with installation until substrates have been properly prepared and deviations from manufacturer's recommended tolerances are corrected. Commencement of installation constitutes acceptance of conditions.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + - 1. Authorized EcoStar Gold Star applicator shall not proceed until defects are corrected.
    1. Roof System Preparation: Provide clearance on underside of decking or sheathing to allow for specified penetration of fasteners. Manufacturer recommends system be applied only over the following:
       1. Substrate: Minimum 15/32 inch (12 mm) plywood or 7/16 inch (11 mm) OSB decking, properly gapped for expansion.
       2. Substrate: Minimum 3/4 inch (19 mm) tongue and groove wood decking with end gaps not exceeding 1/4 inch (6 mm), and board widths not exceeding 6 inches (152 mm).

\*\* NOTE TO SPECIFIER \*\* Contact manufacturer's Technical Department for requirements.

* + - 1. Substrate: Manufacturer approved metal deck systems. Metal deck systems require installation of nail base insulation of appropriate thickness prior to attaching the roof tiles.

\*\* NOTE TO SPECIFIER \*\* Contact the EcoStar Technical Department for approval of applications on lower slopes or exceptions to this requirement. Delete if not required.

* + 1. Slope of substrate for installation of slate tile roof system shall be a minimum of 3/12. Contact the EcoStar Technical Department for proper tile exposure options depending on product line and roof slope.

\*\* NOTE TO SPECIFIER \*\* Contact the EcoStar Technical Department for approval of applications on lower slopes or exceptions to this requirement. Delete if not required.

* + 1. Slope of substrate for installation of shake tile roof system shall be a minimum of 3/12. Contact EcoStar Technical Department for proper exposure options depending on product line and roof slope.
  1. INSTALLATION
     1. Install in accordance with manufacturer's written instructions and recommendations.
     2. Flashing and Sheet Metal: Install flashing metal and sheet metal in valleys and as required for complete installation. Comply with manufacturer's recommendation for a V-type, W-type, or Double W-type metal valley flashing at valleys.
     3. Install metal edging at eaves and roof edges as required for complete installation.

\*\* NOTE TO SPECIFIER \*\* EcoStar advises that metal flashing and securement of metal should be to industry standards (SMACNA) to prevent the metal from pulling free or buckling. EcoStar also recommends that all flashing metal be stainless steel or copper.

* + 1. Installation of Underlayment:

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + - 1. Glacier Guard:
         1. Lap end joints 6 inches (152 mm) and side joints 3.5 inches (89 mm).
         2. Apply continuous 36 inch (914 mm) wide sheet in valley centered over valley.
         3. Apply rows of 36 (914 mm) wide sheets along eaves and rakes. Lap end joints 6 inches (152 mm) and side joints 3.5 inches (89 mm).
         4. Apply rows of 36 inches (914 mm) wide sheets along and around dormers and roof protrusions. Lap end joints 6 inches (152 mm) and side joints 3.5 inches (89 mm).
         5. Install underlayment up head walls or vertical walls; unless installation conditions do not permit, a minimum of 12 inches (305 mm).
         6. Do not leave Glacier Guard Granular Surface (100) exposed to weather more than 30 days after beginning of installation. Do not leave Glacier Guard Smooth Surface High Temp (300) (black) exposed to the weather more than 60 days after the beginning of installation. (White can be left exposed up to 120 days) Installation of Glacier Guard at temperatures below 40 degrees F (4.5 degrees C) may require nailing to hold membrane in place while adhesion develops.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + - 1. Aqua Guard:
         1. Apply 41.5 inches (1054 mm) wide sheet over complete deck, lapping the area covered with Glacier Guard. Lap end joints 6 inches (152 mm) and side joints 4 inches (102 mm) and double through valleys.
         2. Do not leave exposed to weather more than 180 days after beginning of installation. Follow manufacturer's installation instructions for 30 to 180 day exposure.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + - 1. GAF VersaShield:
         1. Install GAF VersaShield underlayment over the entire deck surface, including over Glacier Guard.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + - * 1. Install in conjunction with Class A roof tiles for those projects requiring a UL Class A fire rating. GAF VersaShield shall be installed per manufacturer's specification.
    1. Roof Tile Installation:
       1. After installing underlayment and before installing the roof tiles, clean the surface of debris and dirt.
       2. Place tiles so color variations are evenly distributed over entire roof area. Shade variation occurs differently from pallet to pallet and within individual pallets; blend tiles between bundles and pallets to insure even distribution of color variations. Contact EcoStar Customer Service for available factory blending options.
          1. Blending: Color "mapping" or "blotching" in appearance is not acceptable.

\*\* NOTE TO SPECIFIER \*\* EcoStar authorized Gold Star applicator required to obtain manufacturer's warranty. Delete if not applicable to project.

* + - * 1. EcoStar authorized Gold Star applicator shall correct appearance in the event of color "mapping" or "blotching."
      1. Minimum Fastening: 2 ring shank fasteners per tile shall be used. Fasteners shall be installed at the designated "nail here" marks on the tile. Contact EcoStar Technical Department for proper nail lengths depending on product line used.
      2. If using a pneumatic nailer, do not over drive nails, causing the tiles to curl upward. Remove overdriven tiles and re-fasten in accordance with manufacturers recommendations.
      3. Do not install tiles with an upward curve. Bend each tile in a downward arc before nailing. Do not hold tiles from behind while nailing, as this will cause an upward curl of the tile. Bending not required for Niagara Slate or Shake Plus tiles.
      4. Do not install tiles butted against each other. Maintain a minimum gap of 3/8 inches (9.5 mm) between installed tiles. Maintain a minimum 3/8 inches (9.5 mm) gap between installed tiles and sidewalls or roof protrusion.
      5. Beginning at the eave, install a starter row of roof tiles gapped a minimum of 3/8 inches (9.5 mm) between tiles and protrusion while achieving a 3/4 inches (19 mm) overhang with two EcoStar ring shank fasteners per tile (in location shown on tiles). This layer of tiles will become the starter row. The final tile at roof edges to be a minimum of 3 inches (76 mm) wide. This may involve cutting the roof tile to fit.
         1. To Cut the Roof Tile: Score the tile with a straight edge and utility knife and snap tile at that score. Empire Shake Plus tiles are more easily cut with a saw.
      6. Install first course of tiles in the same manner as the starter row with the exception of the second layer having an offset to the starter row. The first course of tiles shall be installed flush with the starter row with no exposure.
      7. Continue installing tile courses up the roof slope to achieve specified exposure. Place chalk lines horizontally up the roof slope for every tile course.
         1. Do not use red chalk, as this will permanently stain the roof tiles.

\*\* NOTE TO SPECIFIER \*\* EcoStar authorized Gold Star applicator required to obtain manufacturer's warranty. Delete if not applicable to project. Delete if not required.

* + - 1. It is the responsibility of the Gold Star Authorized Applicator to ensure that each roof tile has been bent to provide a downward curve prior to tile fastening. Bending not required for Niagara or Shake Plus Tiles.
      2. Valley Areas:

\*\* NOTE TO SPECIFIER \*\* Delete valley design not required.

* + - * 1. For an open valley design leave a minimum of 2 inches (51 mm) on each side of the center of the valley exposed and uncovered by the roof tiles. A V-Style, W-Style, or Double W-Style valley metal are acceptable.
        2. For a closed valley design cut the tiles in a straight line to fit no closer than 3/8 inch (9.5 mm) against tile of adjoining roof slope.
      1. If roof tiles have been stored in temperatures below 45 degrees F (7.2 degrees C), bring tiles back to manufacturer's minimum material installation temperature of 45 degrees F (7.2 degrees C).
      2. Hip and Ridge Tiles:
         1. Install hip and ridge tiles at hip locations. Place a chalk line up the hip line.
    1. Ridge Vent Installation:
       1. Install ridge vent system as per manufacturer's application instructions and then place hip and ridge tile over the ridge vent.
       2. A minimum 2-1/2 inches (63.5 mm) stainless steel ring shank, hand-driven fastener shall be used on a ventilated hip and ridge to fasten the hip and ridge tile to deck.
       3. A minimum 2 inch (51 mm) stainless steel, hand-driven fastener shall be used on an unventilated hip and ridge to fasten the hip and ridge tile to the deck.
       4. Place fasteners in the location marked on the tile. Install hip and ridge tile at the proper exposure for the product line.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + 1. Phased Roofing: The weathering process of the tiles begins immediately upon installation and exposure to the elements. Install at a continuous rate to completion. Avoid lengthy delays which may result in appearance differences.
  1. PROTECTION AND CLEANING
     1. Protect installed products until completion of project. Minimize foot traffic over completed areas of the roof.
     2. Upon completion of the roof system installation, inspect and remove debris from roof. Cleaning of soiled areas and debris is the responsibility of the applicator.
     3. Use cleaners approved by manufacturer to wash a roof assembly.
     4. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION